



SEQUENCE LISTING

RECEIVED
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TECH CENTER 1600/2900

<110> Kawakami, Akira
Terami, Fumihiko

<120> LOW TEMPERATURE EXPRESSION CHITINASE cDNAs AND METHOD FOR
ISOLATING THE SAME

<130> 107156-00004

<140> US 09/534,229

<141> 2000-03-24

<160> 8



E
<170> PatentIn version 3.0

<210> 1

<211> 256

<212> PRT

<213> Triticum aestivum

<400> 1

Met Ala Arg Phe Ala Ala Leu Ala Val Cys Ala Ala Ala Leu Leu Leu

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10

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Ala Val Ala Ala Gly Gly Ala Ala Ala Gln Gly Val Gly Ser Val Ile

20

25

30

Thr Arg Ser Val Tyr Ala Ser Met Leu Pro Asn Arg Asp Asn Ser Leu
35 40 45

Cys Pro Ala Arg Gly Phe Tyr Thr Tyr Asp Ala Phe Ile Ala Ala Ala
50 55 60

Asn Thr Phe Pro Gly Phe Gly Thr Thr Gly Ser Ala Asp Asp Ile Lys
65 70 75 80

Arg Asp Leu Ala Ala Phe Phe Gly Gln Thr Ser His Glu Thr Thr Gly
85 90 95

Gly Thr Arg Gly Ala Ala Asp Gln Phe Gln Trp Gly Tyr Cys Phe Lys
100 105 110

Glu Glu Ile Ser Lys Ala Thr Ser Pro Pro Tyr Tyr Gly Arg Gly Pro
115 120 125

Ile Gln Leu Thr Gly Arg Ser Asn Tyr Asp Leu Ala Gly Arg Ala Ile
130 135 140

Gly Lys Asp Leu Val Ser Asn Pro Asp Leu Val Ser Thr Asp Ala Val
145 150 155 160

Val Ser Phe Arg Thr Ala Met Trp Phe Trp Met Thr Ala Gln Gly Asn
165 170 175

Lys Pro Ser Cys His Asn Val Ala Leu Arg Arg Trp Thr Pro Thr Ala
180 185 190

Ala Asp Thr Ala Ala Gly Arg Val Pro Gly Tyr Gly Val Ile Thr Asn
195 200 205

Ile Ile Asn Gly Gly Leu Glu Cys Gly Met Gly Arg Asn Asp Ala Asn
210 215 220

E1
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Val Asp Arg Ile Gly Tyr Tyr Thr Arg Tyr Cys Gly Met Leu Gly Thr
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Ala Thr Gly Gly Asn Leu Asp Cys Tyr Thr Gln Arg Asn Phe Ala Ser
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<212> PRT

<213> Triticum aestivum

<400> 2

Met Ser Thr Leu Arg Ala Arg Cys Ala Thr Ala Val Leu Ala Val Val
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Leu Ala Ala Ala Ala Val Thr Pro Ala Thr Ala Glu Gln Cys Gly Ser
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Gln Ala Gly Gly Ala Lys Cys Ala Asp Cys Leu Cys Cys Ser Gln Phe
35 40 45

Gly Phe Cys Gly Thr Thr Ser Asp Tyr Cys Gly Pro Arg Cys Gln Ser
50 55 60

Gln Cys Thr Gly Cys Gly Gly Gly Gly Gly Val Ala Ser Ile Val
65 70 75 80

Ser Arg Asp Leu Phe Glu Arg Phe Leu Leu His Arg Asn Asp Ala Ala
85 90 95

Cys Leu Ala Arg Gly Phe Tyr Thr Tyr Asp Ala Phe Leu Ala Ala Ala
100 105 110

Gly Ala Phe Pro Ala Phe Gly Thr Thr Gly Asp Leu Asp Thr Arg Lys
115 120 125

E!
Cmt

Arg Glu Val Ala Ala Phe Phe Gly Gln Thr Ser His Glu Thr Thr Gly
130 135 140

Gly Trp Pro Thr Ala Pro Asp Gly Pro Phe Ser Trp Gly Tyr Cys Phe
145 150 155 160

Lys Gln Glu Gln Gly Ser Pro Pro Ser Tyr Cys Asp Gln Ser Ala Asp
165 170 175

Trp Pro Cys Ala Pro Gly Lys Gln Tyr Tyr Gly Arg Gly Pro Ile Gln
180 185 190

Leu Thr His Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Val
195 200 205

Asp Leu Leu Asn Asn Pro Asp Leu Val Ala Thr Asp Pro Thr Val Ala
210 215 220

Phe Lys Thr Ala Ile Trp Phe Trp Met Thr Thr Gln Ser Asn Lys Pro
225 230 235 240

Ser Cys His Asp Val Ile Thr Gly Leu Trp Thr Pro Thr Ala Arg Asp
245 250 255

Ser Ala Ala Gly Arg Val Pro Gly Tyr Gly Val Ile Thr Asn Val Ile
260 265 270

Asn Gly Gly Ile Glu Cys Gly Met Gly Gln Asn Asp Lys Val Ala Asp
275 280 285

Arg Ile Gly Phe Tyr Lys Arg Tyr Cys Asp Ile Phe Gly Ile Gly Tyr
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Gly Asn Asn Leu Asp Cys Tyr Asn Gln Leu Ser Phe Asn Val Gly Leu
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<210> 3

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<212> PRT

<213> Triticum aestivum

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Ser Ala His Ala Glu Gln Cys Gly Ser Gln Ala Gly Gly Ala Thr Cys

20 25 30

Pro Asn Cys Leu Cys Cys Ser Lys Phe Gly Phe Cys Gly Thr Thr Ser

35 40 45

Asp Tyr Cys Gly Thr Gly Cys Gln Ser Gln Cys Asn Gly Cys Ser Gly

50 55 60

Gly Thr Pro Val Pro Val Pro Thr Pro Ser Gly Gly Gly Val Ser Ser

65 70 75 80

Ile Ile Ser Gln Ser Leu Phe Asp Gln Met Leu Leu His Arg Asn Asp

85 90 95

Ala Ala Cys Leu Ala Lys Gly Phe Tyr Asn Tyr Gly Ala Phe Val Ala

100 105 110

Ala Ala Asn Ser Phe Ser Gly Phe Ala Thr Thr Gly Ser Thr Asp Val

115 120 125

Lys Lys Arg Glu Val Ala Ala Phe Leu Ala Gln Thr Ser His Glu Thr

130 135 140

E1
cont

Thr Gly Gly Trp Pro Thr Ala Pro Asp Gly Pro Tyr Ser Trp Gly Tyr
145 150 155 160

Cys Phe Asn Gln Glu Arg Gly Ala Thr Ser Asp Tyr Cys Thr Pro Ser
 165 170 175

Ser Gln Trp Pro Cys Ala Pro Gly Lys Lys Tyr Phe Gly Arg Gly Pro
 180 185 190

Ile Gln Ile Ser His Asn Tyr Asn Tyr Gly Pro Ala Gly Gln Ala Ile
 195 200 205

Gly Thr Asp Leu Leu Asn Asn Pro Asp Leu Val Ala Ser Asp Ala Thr
 210 215 220

Val Ser Phe Lys Thr Ala Leu Trp Phe Trp Met Thr Pro Gln Ser Pro
225 230 235 240

Lys Pro Ser Ser His Asp Val Ile Thr Gly Arg Trp Ser Pro Ser Gly
 245 250 255

Ala Asp Gln Ala Ala Gly Arg Val Pro Gly Tyr Gly Val Ile Thr Asn
 260 265 270

Ile Ile Asn Gly Gly Leu Glu Cys Gly Arg Gly Gln Asp Gly Arg Val
 275 280 285

Ala Asp Arg Ile Gly Phe Tyr Lys Arg Tyr Cys Asp Leu Leu Gly Val
 290 295 300

Ser Tyr Gly Asp Asn Leu Asp Cys Tyr Asn Gln Arg Pro Phe Ala
305 310 315

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<211> 23

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<213> Artificial

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<222> (1)..(23)
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<222> 12, 18
<223> n can be one of a,c,t, or g

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cacgagacca cnggcgntg ggc

23

<210> 5
<211> 20
<212> DNA
<213> Artificial

<220>
<221> misc_feature
<222> (1)..(20)
<223> Artificial primer.

<220>
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<223> n can be one of a,c,t, or g

E!
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<211> 771

<212> DNA

<213> Triticum aestivum

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<221> misc_feature

<222> (1)..(771)

<223> cDNA

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ctgccaacc gcgacaactc gctgtgccc gccagagggt tctacacgta cgacgccttc 180

atcgccgccg ccaacacctt cccgggttc ggcaccaccg gcagcgccga cgacatcaag 240

cgcgacctcg ccgccttctt cgccagacc tccacgaga ccaccggagg gacgagaggc 300

gctgccgacc agttccagtg gggctactgc ttcaaggaag agataagcaa ggccacgtcc 360

ccaccatact atggacgggg acccatcaa ttgacagggc ggtccaacta cgatcttgcc 420

gggagagcga tcggaagga cctgtgagc aaccagacc tagtgtccac ggacgcggtg 480

gtgtccttca ggacggccat gtggttctgg atgacggcgc agggaaacaa gccgtcgtgc 540

E1
cont

cacaacgtcg ccctacgccg ctggacgccg acggccgccg acaccgctgc cggcagggtg 600

cccggatacg gagtgatcac caatatcatc aacggcgggc tcgagtgcgg aatgggccgg 660

aacgacgcc aacgtgaccg catcggctac tacacgcgct actgcggcat gctcggcacg 720

gccaccggag gcaacctcga ctgtacacc cagaggaact tcgctagcta g 771

<210> 7

<211> 972

<212> DNA

<213> Triticum aestivum

<220>

<221> misc_feature

<222> (1)..(972)

<223> cDNA

<400> 7

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gcggtcacgc cggccacggc cgagcagtgc ggctcgcaag ccggcggcgc caagtgcgcc 120

gactgcctgt gctgcagcca gttcgggttc tgcggcacca cctccgacta ctgcggcccc 180

cgctgccaga gccagtgcac tggctgcggt ggccggcgcg gcggggtggc ctccatcgtg 240

tccagggacc tcttcgagcg gttcctgctc catcgcaacg acgcagcgtg cctggccccg 300

gggttctaca cgtacgacgc ctcttggcc gccgccggcg cgttcccggc ctccggcacc 360

accggagacc tggacacgcg gaagcgggag gtggcggcct tcttcggcca gacctctcac 420

gagaccaccg gcgggtggcc caccgcgccc gacggcccct tctcatgggg ctactgttc 480

E!
Cont

aagcaggagc agggctcgcc gccgagctac tgcgaccaga gcgccgactg gccgtgcgca 540

cccggaagc agtactatgg ccgcggcccc atccagctca ccacaacta caactacgga 600

ccggcgggcc gcgcaatcgg ggtggacctg ctgaacaatc cggacctggt ggccacggac 660

ccgacagtgg cgtcaagac ggcgatatgg ttctggatga cgacgcagtc caacaagccg 720

tcgtgcatg acgtgatcac ggggctgtgg actccgacgg ccagggatag cgagccgga 780

cggtatcccg ggtatggtgt catcaccaac gtcatcaacg gcgggatcca atgcggcatg 840

gggcagaacg acaagggtggc ggatcgatc gggttctaca agcgctattg tgacattttc 900

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gcggcacagt ga

972

<210> 8

<211> 960

<212> DNA

<213> Triticum aestivum

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<221> misc_feature

<222> (1)..(960)

<223> cDNA

<400> 8

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gagcaatgcg gctcgcaggc cggcggggcg acgtgccccca actgcctctg ctgcagcaag 120

E1
Cont

ttcggtttct gcggcaccac ctccgactac tgcggcaccg gctgccagag ccagtgaat 180

ggctgcagcg gcggcacccc ggtaccggtta ccgacccct cggcgggcg cgtctctcc 240

attatctgc agtcgtctt cgaccagatg ctgctgcacc gcaacgacgc ggcgtgctg 300

gccaaggggt tctacaacta cggcgcttc gtcgcccg ccaactcgtt ctgggcttc 360

gcgaccacag gtagcaccga cgtcaagaag cgcgaggtgg ccgcttct cgtcagact 420

tcccacgaga cgaccggcg gtagccgacg gcgcccacg gccctactc ctggggctac 480

tgcttaacc aggagcgcg cgccacctc gactactga cgcgagctc gcagtggcca 540

tgtgcgccg gcaagaagta cttcgggagc gggcccatcc agatctaca caactacaac 600

tacgggccg cggggcaggc catcggcacc gacctgctc acaaccgga cttgtggcg 660

tcggacgca ccgtgtcgt taagacggcg ttgtgttct ggaagacgc gcaatcacc 720

aagccttga gccacgacgt gatcacgggc cgttgagcc cctcgggagc cgaccaggcg 780

gcggggaggg tgctgggta cgtgtgatc accaactca tcaacggtg gctcgagtgc 840

gggcgcgggc aggacggcg tgcgccgac cggatcgggt tctacaagc ctactcgac 900

ctcctggcg tcagctacg tgacaacctg gactgctca accaaaggcc gttcgcatag 960

E1
Cont

